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Barriers to Digital Transformation of the Silver Economy: Challenges to Adopting Digital Skills by the Silver Generation

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ABSTRACT

In the European Union (EU) and the Baltic Sea Region (BSR), life expectancy amongst the population has increased. As the population ages and the percentage of older people in the total population upsurges, there is a dire requisite to address their needs such as higher risks of chronic disease, dependability, disability and a requirement for assistance. Another integral challenge for the elderly is the need to participate in economic and social activities. It is essential to develop systems to ensure that the needs of the ageing population are met efficiently. Information and Communication Technology (ICT) and innovations such as robotics, artificial intelligence (AI), cloud computing and digital infrastructure help facilitate healthy and active ageing, as well as independent living solutions for the elderly. With all these technological advancements being introduced, the silver generation must be also capable of adopting them. The innovative solutions can be deemed a waste of resources if the target group is incapable of benefitting from them. In this research, a systematic literature review is conducted to identify the technology readiness, technology acceptance and level of digital skills of the silver generation as well as the barriers and challenges towards the adoption of digital transformation in the silver economy. The resulting articles are analysed using thematic analysis with NVIVO and the main outcomes help in identifying and analyzing the attitude of the silver generation towards ICT, barriers and challenges to ICT adoption and the existing digital tools and solutions that are easily adopted by the silver generation to serve as benchmarks to introduce further innovations for the silver economy. Moreover, recommendations are provided on how digital transformation can be used as a tool to engage the elderly in the economy by addressing the hindering factors to ICT adoption. Overall, the findings of this research contribute to the literature and can serve as a useful resource for other regions facing similar challenges in addressing the needs of an ageing society.

Keywords: Information and communication technology, Silver economy, Digital transformation, Digital skills, Technology adoption

INTRODUCTION

With the advancement in the social, economic and medical spheres, life expectancy amongst the global population, especially those in the more developed areas of the world has increased (Pauhofova & Dovalova, 2015). This change

is explained in population demographics as modifications in the age structure based on improvements in their living circumstances (Linz & Stula, 2010). While this demographic change is affecting the entire global population, it is more evident in the developed areas of the world like Europe and North America (Georgantzi, 2018).

According to the United Nations (2020), the number of persons aged 65 and above was 727 million in 2020, which is expected to reach 1.5 billion by the mid-century (United Nations, 2020). This implies that by 2050, 1 out of 6 people in the world will be aged 65 or above. The percentage of older people in the population had already drastically increased between the years 1950 and 2000, especially in European countries (Grundy & Murphy, 2017). Amongst the EU, the Baltic Sea Region (BSR) countries are termed among the *"most ageing areas of the world"* (Berzins & Zvidrins, 2011).

As the ratio of working-age to retired citizens dwindles in developed economies like the EU and BSR, the only way forward is to capitalize on the opportunities created by technology (Anderberg, 2020). Innovations in the technological landscape can be harnessed to address the needs of the silver generation as they age. ICT can be a viable solution to fulfil the needs of the ageing society. According to Obi et al (2013), the Ministry of Internal Affairs and Communications and the Ministry of Health and Welfare in Japan have been promoting the *"active life strategy"* to improve the lives of their senior citizens (Obi, et al., 2013). Based on this strategy, they are promoting the development of societies and townships that employ sensor wireless and cloud technologies to address the challenges associated with ageing populations. Hence, ICT innovations like mobile, cloud computing, and social media can work as enablers or catalysts for silver economy development.

In order for these innovations to successfully help the silver generation, it is imperative to understand the technology readiness of this particular population segment. The innovative solutions can be deemed a waste of resources if the target group is incapable of benefitting from them. In this research, a systematic literature review is conducted to analyse the technology readiness of the silver generation and the barriers and challenges faced by the silver economy towards digital transformation. As a result, these barriers can be addressed to serve as the basis for new entrepreneurial opportunities. For this study, the silver economy refers to the economic activities, businesses, and investments related to the '55+' demographic and the provision of products and services for older adults (European Commission, 2021). The term "silver generation" typically refers to individuals who are 55 years old and above and are still active and engaged in society (United Nations, 2017). This demographic is often characterized by their wealth, experience, and purchasing power, making them an important market segment for businesses.

In particular, the research questions of the study are:

1. What is the level of the technology readiness of the silver generation?
2. What are the barriers and challenges towards ICT adoption and digital transformation in the silver economy?

3. How can these barriers and challenges towards digital transformation be addressed to increase the technology readiness of the silver generation?

The remaining paper is organized as follows: Sect. 2 outlines the research methodology used for the systematic literature review. Results are elaborated in Sect. 3 and discussion and recommendations are provided in Sect. 4 and finish the paper with a conclusion in Sect. 5.

RESEARCH METHODOLOGY

A Systematic Literature Review (SLR) will be used to condense and systematically present scientific results on the research topic that might be scattered over a significant number of sources. Kitchenham's "Guidelines for performing Systematic Literature Reviews in Software Engineering" is used as a basis to achieve the research goals through a transparent and objective approach (Kitchenham & Charters, 2007).

Based on Kitchenham's guidelines, an SLR is performed in five stages: (i) Search Strategy, (ii) Study Selection, (iii) Study Quality Assessment, (iv) Data Extraction, (v) Data Synthesis (Kitchenham & Charters, 2007).

Search Strategy

A set of search terms are selected based on the research questions identified in the Sect. 1. The next step is to create a search string using "AND" and "OR" combinations to look for pertinent scientific papers in the database.

Search Terms: Often, senior citizens, silver economy, ageing population, elderly, seniors, and ageing are all synonymously used and therefore are the primary search terms. ICT adaptation and Technology adoption and other terms for technology acceptance are used synonymously for technology readiness and therefore, are the secondary search terms and also include keywords such as barrier, challenges, difficulties, obstacles and more. Combining search terms with "AND" and "OR" operators resulted in the following search string:

("Silver economy" OR "Senior Citizens" OR "ageing population" OR "elderly" OR "seniors" OR "ageing" OR "old population" OR "55+" OR "Older adults" OR "grey population") AND ("ICT acceptance" OR "Assistive technology" OR "ICT" OR "technology" OR "Smart Technology" OR "Smart homes" OR "Acceptance" OR "Usability" OR "Use" OR "Adoption" OR "behavioural intention" "usability of technology" OR "technology usage" OR "technology acceptance" OR "technology readiness" OR "innovation acceptance" OR "resistance to change" OR "ICT adaptation" OR "Technology adoption") AND ("barriers" OR "challenges" OR "difficulties" OR "obstacles" OR "problems" OR "perception" OR "influencing factors" OR "willingness to use" OR "willingness to adopt" OR "Factors to adopt" OR "barriers to adopt").

Search Process: The resulting search string was used to search for the relevant articles in the Scopus database. Scopus is a bibliographic database

that covers a wide range of academic disciplines, including science, technology, medicine, social sciences, and arts and humanities. It is one of the largest databases of peer-reviewed literature, with over 76 million records, and is widely used by researchers, students, and librarians around the world (Scopus, 2023). According to the initial selection criteria, 800 articles were found between 2000 and 2022. The documents were sorted by the most cited articles in the database.

Study Selection

The next stage is the selection of articles. In this research, a two-stage selection of articles for research was applied.

Selection Phase 1: During this stage, one researcher reviewed the titles of articles and, based on the inclusion criteria set out in Table 1, assessed them to include in the research. In case of doubt, the researcher also was acquainted with the keywords and abstract of the studies. After the completion of this stage, 48 articles were chosen.

Selection Phase 2: Further, quality assessment criteria were formed (Table 2) and used to further narrow down the articles selected from Phase 1. After quality assessment, 13 articles remained and any article that was from before 2010 was also excluded. At this stage, 9 articles were selected.

Table 1. Inclusion criteria for selection phase 1.

Criteria ID	Inclusion Criteria
IC1	The article focuses on the technology readiness of the silver generation.
IC2	The article explains the importance of technology for the silver generation.
IC3	The article describes different use cases of technology adoption of the silver generation.
IC4	The article includes different types of technologies and digital tools for the silver generation.
IC5	The article focuses on barriers and challenges of technology adoption for the silver generation.
IC6	The article explains the theoretical foundations of technology adoption and acceptance by the silver generation.
IC7	The article outlines the perceptions of the silver generation towards technology.

Table 2. Quality criteria checklist for selection phase 2.

Criteria ID	Quality Criteria Check-List
QC1	Are the research objectives clearly defined in the study?
QC2	Does the study propose methods or solutions to improve the technology readiness of the silver generation?
QC3	Are the challenges to technology adoption clearly defined in the study?
QC4	Does the study provide insights into different stakeholders and their roles in increasing the technology readiness of the silver generation?
QC5	Does the study highlight the potential benefits of using technology for the silver generation?
QC6	Are different perceptions of the silver generation towards technology and ICT adoption highlighted?
QC7	Does the study highlight different types of technologies and digital tools for the silver generation?
QC8	Does the study investigate the different factors that lead to acceptance of the digital tools by the silver generation?

Study Quality Assessment

At this stage, two independent researchers from Tallinn University of Technology, Estonia (Silvia Lips and Rahul Sharma) evaluated the articles selected from the previous stage based on the Quality Criteria Checklist in Table 2. Each article was rated on a 5-point Likert scale, where the answers were coded as follows: 1 – entirely disagree, 2 – disagree, 3 – neutral, 4 – agree, and 5 – entirely agree. In order to evaluate each article, it was necessary to meet all the pre-established Quality Criteria and, depending on the answer to the question, assign points to each article according to the evaluation system. All articles scoring three or higher were included in the further review. Below is a table from all three independent researchers with the average of all ratings (Kitchenham & Charters, 2007).

Data Extraction and Synthesis

Data extraction represents the process by which the researcher obtains the necessary information about the characteristics of the study and the results included in the study. Table 4 presents a list of final selected studies with study titles, publication types, authors and years. Also, for each article, an individual ID was selected.

Thematic Analysis

At the stage of data synthesis, summation and comparison of data obtained from selected studies are performed using the method of thematic analysis from Braun and Clarke (Braun & Clarke, 2006). The thematic analysis makes it possible to identify and highlight repetitive patterns, themes, and meanings in the data. Thematic analysis was done using NVIVO. Further, based on the findings, research questions are answered.

RESULTS

The literature review analysis revealed several key themes; the attitude towards ICTs, barriers to adoption, age and education, and design and inclusion. These themes provide insights into the factors that influence older adults'

Table 3. Quality score of selected studies total average.

Study ID	QC1	QC2	QC3	QC4	QC5	QC6	QC7	QC8	Total Average Score
S1	5	3	4	3	3	3	3	5	3.625
S2	5	3	4	3	3	5	4	4	3.875
S3	4	3	4	3	3	4	3	4	3.5
S4	5	4	4	3	3	5	4	3	3.875
S5	4	3	5	3	3	4	3	4	3.625
S6	5	4	3	3	4	4	3	3	3.625
S7	5	4	4	3	3	3	4	4	3.75
S8	4	4	3	4	3	4	3	3	3.5
S9	5	4	5	3	4	4	4	4	4.125

Table 4. List of final selected studies.

Study ID	Study Title	Authors	Year	Publication Type
S1	A Study on Elderly Individuals' Attitude towards ICTs (**Pargaonkar, et al., 2019**)	Pargaonkar, A.; Mishra, W.; Kadam, S.	2019	Book Chapter
S2	Interviews with digital seniors: ICT use in the context of everyday life (**Quan-Haase, et al., 2016**)	Quan-Haase, A.; Martin, K.; Schreurs K.	2016	Journal Article
S3	Coming of (old) age in the Digital Age: ICT Usage and Non-Usage among Older Adults (**Neves, et al., 2013**)	Neves, B. B.; Amaro, F.; Fonseca, J.	2013	Journal Article
S4	Technology Adoption and Learning Preferences for Older Adults: Evolving Perceptions, Ongoing Challenges, and Emerging Design Opportunities (**Pang, et al., 2021**)	Pang, C.; Collin Wang, Z.; McGrenere, J.; Leung, R.; Dai, J.; Mofatt, K.	2021	Conference Paper
S5	Exploring how Internet services can enhance elderly well-being (**Bianchi, 2021**)	Bianchi, C.	2021	Journal Article
S6	Inclusion of Older Adults in the Research and Design of Digital Technology (**Mannheim, et al., 2019**)	Mannheim, I.; Schwartz, E.; Xi, W.; Buttigieg, S. C.; McDonnell-Naughton, M.; Wouters, E. J. M.; Zaalen, Y. V.	2019	Journal Article
S7	"These devices have not been made for older people's needs" – Older adults' perceptions of digital technologies in Finland and Ireland (**Pirhonen, et al., 2020**)	Pirhonen, J.; Lolich, L.; Tuominen, K.; Jolanki, O.; Timonen, V.	2019	Journal Article
S8	The use of information and communication technologies by older people with cognitive impairments: from barriers to benefits (**Blok, et al., 2020**)	Marije Blok, M.; Ingen, E.; Boer, A. H.; Slootman, M.	2020	Journal Article
S9	Technology to Support Aging in Place: Older Adults' Perspectives (**Wang, et al., 2019**)	Shengzhi Wang, S.; Bolling, K.; Mao, K.; Reichstadt, J.; Jeste, D.; Kim, H.; Nebeker, C.	2019	Article

adoption and use of ICTs, the ways they use ICTs, and the importance of considering older adults' perspectives and needs when designing technology for them.

Attitude Towards ICTs

The elderly population generally has a positive attitude towards the use of ICT technologies and recognizes their potential benefits. However, various factors can affect this attitude, such as perceived willingness to learn, willingness to ask for assistance, perceived self-efficacy in learning, and willingness to invest time and money in new technology (S1).

One of the main reasons for this positive attitude is the belief that ICTs can help overcome social isolation, with many respondents reporting feeling closer to family and friends due to the use of technology (S1). Support and assistance from family and peers also have a positive influence on the attitude of the elderly towards adopting ICT (S1).

The literature also indicates that the elderly population primarily uses ICT for gaining knowledge and information, but often adopts a hybrid approach,

using both technology and traditional methods such as books (S2). Google is the most commonly used search engine, and genealogy is the most common type of research conducted online (S2). Audiobooks are also gaining popularity among the elderly as a reading format due to changes in physical capabilities such as reducing vision and blurred eyesight (S2).

The motivation to use ICT technology also comes in the form of peer pressure from friends and family, with many participants having a social media presence due to recommendations from family members (S2). Skype is commonly used for staying in touch with families and is found to be more useful than other platforms like Facebook and Twitter (S2).

The literature also shows that the majority of the elderly population owns a mobile phone and uses it for communication with family, and friends, and in emergencies (S3). This provides benefits such as family proximity, safety and convenience (S3). The elderly feel more comfortable with new technology when they first try it independently, and if they are not able to understand it, they often turn to family for assistance (S4). There is also a general interest among the elderly to learn about ICT and new technologies (S4).

Additionally, the literature suggests that the elderly prefer to use the internet on their phones or tablets rather than laptops (S5). They use internet services regularly for communication, paying bills and e-commerce (S7), with Facebook and WhatsApp being the most common platforms used (S5). Adopting new technologies leads to better well-being in terms of enjoyment, personal growth, environmental mastery, autonomy, and social connectedness (S5).

Lastly, a study from Finland and Ireland suggests that the elderly recognize the potential benefits of technology in their everyday lives, such as convenience and an incredible source of information. They use the internet to find information on illnesses, services, practical guidance as well as hobbies and social contacts. In Ireland, the elderly were more interested in services where their medical records could be accessed by different healthcare providers instead of repeating the same information every time. Whatsapp and Skype were most commonly used for communication purposes (S7).

Barriers to Adoption

Age-related health issues, such as vision impairment, cognitive decline, and decreased motor control, were found to be the main reason for elderly individuals finding it difficult to learn new technology (S1). Additionally, a sense of security and lack of trust were also considered potential barriers to ICT adoption (S2).

Participants in these studies also expressed concerns about the cost, functionality, and size of technology, such as mobile phones and computers (S3). The perceived dangers associated with the internet, such as fraud and paedophilia, also played a role in the reluctance of some elderly individuals to adopt ICTs (S3). Attitudinal and functional factors were found to play a major role in ICT usage among the elderly, rather than physical factors (S3).

Comfort, familiarity, and easy access to traditional non-digital tools, such as notepads and paper calendars, were found to be major reasons for the

elderly preferring these tools over digital alternatives when it comes to tracking their health (S4). A lack of knowledge and awareness about new technologies, such as smartwatches, was also identified as a barrier to adoption (S4). The elderly also expressed concerns about the cost of devices, as well as the complexity of manuals and instructions associated with new technologies (S4).

Anxiety and frustration were also found to be major barriers to ICT adoption among the elderly, particularly for those who were never exposed to such technology and lacked the adequate skills to use them (S5). The traditional ways of doing things, such as visiting retail stores and banks, were found to be more enjoyable experiences for the elderly than interacting with technology (S5). Cognitive and physical impairments, such as the decline in memory or inability to follow instructions, also affected ICT adoption among the elderly (S5).

Elderly participants from Ireland mentioned how technology is rapidly changing and invading every aspect of their lives which adds to their anxiety (S7). The age-based decline in functional abilities of the elderly also leads to resistance to ICT adoption (S7). Unreadable tiny screens and uninviting user interfaces were also found to be major causes of technology not enticing the elderly (S7).

S9 identified several key barriers towards ICT adoption and digital platforms which include technology unusability, technology illiteracy, poor data management and lack of privacy and not involving the elderly in technology design.

Age and Education

According to research, the frequency of internet use is highly correlated to age, gender, and employment status among the elderly population. A disparity was observed between those in the age group of 55–65 and those over 65. It was found that the 55–65 age group was more positive, motivated, and confident in using ICT, and had adopted it better than those over 65 (S1).

It was also found that a typical ICT user among the elderly population is typically a male in the age group of 55–74 who has at least secondary education and has previously worked or had experience in specialized or technical fields (S3). On the other hand, a typical non-user is more likely to be a female over 75 with less than secondary education, retired, and previous experience in non-technical fields such as agriculture. Additionally, as age increases, the likelihood of using smart devices decreases (S3).

Literature also highlights the presence of a digital divide among different age groups within the ageing population. Younger elderly individuals were found to be more comfortable with using new technology than older ones (S5). Research (S7) found that in Finland, younger and societally active participants were more active on the internet, particularly on social media. However, in Ireland, internet penetration in everyday life is not as extensive, but younger elderly in the age group of 55–65 with higher education were found to be more comfortable with technology than older and less educated individuals.

Table 5. Summary of ethical considerations and guidelines for inclusion.

Ethical Aspects	Guidelines for Inclusion
Awareness of stereotypes and ageism	(i) Pay attention to appearance and aesthetics. (ii) Disguise technology as an everyday device. (iii) Universal design
Consent and re-consent	(i) Use a broader and more holistic conceptualization of competence; Simplify consent forms. (ii) Account for the setting
Autonomy, trust and respect	(i) Assess a person's needs and wants at a particular time and place. (ii) Provide an "exit" option. (iii) Establish trust and respect for choices
Research methods and tools	Control for the sensory decline. (ii) Adequate instruction on the use and maintenance of devices. (iii) Avoid negative age stereotypes. (iv) Qualitative methods preferred.
Privacy and Confidentiality	(i) Include older adults in the development of invasive devices. (ii) Provide control over access to sensitive information
Safety and Security	(i) Design and study digital technologies in the natural environment. (ii) Include older adults with different conditions and health statuses.

Design and Inclusion

Firstly, it is important to take into account the distinction between the two divisions in the age group of the elderly; 55–65 and 65+ (S1). This distinction provides varying insights and is helpful when developing new design standards and user research guidelines.

Secondly, it is important to find agency when understanding the ICT use of the elderly as they critically consider different options and then make choices based on convenience, affordability and preferences (S2). Designing innovative solutions for the elderly should therefore include giving them the flexibility to choose from different options and decide how they would like to engage with them.

Thirdly, functional factors such as lack of literacy and unavailability of computer/internet access can be very important barriers to ICT adoption among the elderly, and therefore e-inclusion strategies should be considered (S3). These may include training programs tailored for the elderly as well as public policies that facilitate ICT access and usage. It is suggested that policies could include ensuring the availability of computers and internet in community centres and special programs for the elderly to make such equipment affordable for them, such as credit terms or discounts.

The design of products targeted at the elderly should be kept simple and less intrusive (S4). New technologies should come with manuals or easy instructions to walk them through the onboarding and setup phase, and the majority of the elderly prefer interacting with a support person on live mediums like video chat, phone or instant messaging. It is also important for the service providers to understand that the elderly are vulnerable consumers and require assistance when using the internet and e-services (S5). Therefore, including their family members or having a support team to help them get onboarded with digital services will be highly beneficial.

S6 provides ethical considerations along with guidelines for the inclusion of the elderly in research and design of digital technology. It is summarized in the table below:

It is recommended that individual characteristics such as age and social position should be considered when designing digital services (S7). Moreover, it is also important to consider issues at the social level "such as guidelines and regulations on age-friendly design (e.g. size of screens and buttons) and intuitive software." They also recommend incorporating the writing style of websites that could be understood by a 9-year-old and developing more intuitive technology. Moreover, training, support and easy access to helplines are required when deploying digital services for the elderly population (S8).

S9 highlights different barriers and recommends how these could be improved to increase technology readiness and ICT adoption of the elderly in Table 6.

Table 6. Recommendations to lower barriers to ICT adoption.

Barrier	Solution
Technology Usability	• Simple instructions, fewer buttons, larger fonts, and speech-activated tools to be used in smart devices. • A universal remote to operate the television and peripheral devices—technologies.
Technology Literacy	• "How to" manuals that accompany technology devices. • Support personnel to help onboard with new technologies.
Data Management and Privacy	• Provision of feedback as a return on the value of data collected from the elderly.
Technology co-design	• Develop a co-design process that incorporates technology education as a component to increase "tech literacy."

DISCUSSION

Based on the findings from the literature review it is possible to answer the research questions.

1. *What is the level of technology readiness of the silver generation?*

The literature suggests that the level of technology readiness of the silver generation is mixed. On one hand, studies (S1, S2, S3) have found that older adults are increasingly using technology and are interested in using technology to improve their daily lives. They are also willing to learn and adapt to new technologies, especially if they see the benefits and convenience they can bring to them. On the other hand, studies (S4, S5, S6, S7, S9) have also identified several barriers and challenges that hinder the technology readiness and adoption of the silver generation.

2. *What are the barriers and challenges towards ICT adoption and digital transformation in the silver economy?*

The literature identified several barriers and challenges towards ICT adoption and digital transformation in the silver economy. These include:

Technology usability: Studies (S4, S5, S7, S9) have found that older adults often find technology difficult to use and navigate. They may have difficulty reading small fonts, using multiple buttons, or understanding complex instructions.

Technology literacy: Studies (S3, S5, S7, S9) have found that many older adults have limited knowledge and understanding of technology. They may not be familiar with basic concepts such as the internet, email, or social media.

Data management and privacy: Studies (S5, S7, S9) have found that older adults may be concerned about their personal information being shared or used without their consent. They may also be concerned about the security of their personal information when using technology.

Social and cultural factors: Studies (S2, S3, S7) have found that older adults may be influenced by social and cultural factors such as their age, gender, education, and income when it comes to their technology use. They may also be influenced by the attitudes and perceptions of others towards technology.

Lack of access: Studies (S3, S9) have found that lack of access to technology, as well as lack of infrastructure, can be a significant barrier to ICT adoption for older adults. This includes a lack of access to computers, the internet and digital devices, as well as a lack of access to training, support and easy access helplines.

3. *How can these barriers and challenges towards digital transformation be addressed to increase the technology readiness of the silver generation?*

The literature suggests several ways to address the barriers and challenges towards digital transformation in the silver economy. These include:

Technology usability: Studies (S4, S5, S7, S9) recommend designing technology with larger fonts, fewer buttons, and speech-activated tools to make it easier for older adults to use. They also recommend providing simple instructions and training to help older adults understand how to use technology. Moreover, including the elderly in the technology design and validation process will be highly beneficial as they know best what they need.

Technology literacy: Studies (S3, S5, S7, S9) recommend providing training and support to help older adults understand and use technology. This can include providing "how-to" manuals, support personnel to help onboard with new technologies and technology education to increase "tech literacy".

Data management and privacy: Studies (S5, S7, S9) recommend providing clear and transparent information about data collection and usage. Additionally, providing feedback as a return on the value of data collected from the elderly can also increase their trust and understanding of technology.

Social and cultural factors: Studies (S2, S3, S7) recommend considering individual characteristics such as age and socioeconomic status, as well as cultural and social factors when designing and implementing digital technologies for the silver generation. This can include providing language and cultural support, as well as considering the needs of different socioeconomic groups. Additionally, involving older adults in the design and development process can help ensure that technology meets their needs and is more likely to be adopted.

Infrastructure and accessibility: Studies (S1, S2, S7) recommend investing in infrastructure and making technology accessible to older adults, including

providing access to high-speed internet, mobile devices, and digital services in communities where older adults live. This can also include providing transportation and mobility support to help older adults access technology and digital services.

Government and policy support: Studies (S1, S2, S6) recommend involving government and policymakers in the digital transformation of the silver economy. This can include providing funding for technology and digital service development, creating policies that support the use of technology by older adults, and promoting partnerships between the private sector and older adults.

CONCLUSION

The literature reviewed in this paper suggests that the technology readiness of the silver generation is currently at a moderate level, with some older adults being able to effectively use technology and others facing barriers and challenges. These barriers and challenges include issues with technology usability, technology literacy, data management and privacy, and social and cultural factors. To address these barriers and challenges, several strategies have been proposed, such as designing technology with larger fonts and fewer buttons, providing training and support to help older adults understand and use technology, including the elderly in the co-creation of technology and considering individual characteristics such as age and cultural background when designing technology and providing support.

Overall, it is clear that there is a need for further in-depth research and development in this area, as well as greater collaboration between technology developers, private businesses, policymakers, academicians and older adults themselves to ensure that the technology being developed is inclusive and accessible to all older adults. By addressing the barriers and challenges that older adults face in using technology, we can help to improve their quality of life and ensure that they can fully participate in the digital age.

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